

**Upcoming Work  
at  
Buildings 386/388**

**Investigation Area C2**

Presented to  
Mare Island Restoration Advisory Board  
September 24, 2020

# Discussion Topics

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- **Buildings 386/388 Site Description**
- **Historic Investigations and Remedial Activities**
- **Current Status**
- **Upcoming Work**
- **Path Forward**
- **Questions**

# Buildings 386/388 – Site Description



Building 388

Building 386



View is Across Bagley Street  
to the Southeast

# Buildings 386/388 – Site Description (Continued)



**Building 386 - Interior  
View to the South  
(Prior to  
Equipment Removal)**



**Building 386 - Interior  
View to the South  
(Following Equipment  
Removal and  
Remediation)**



**Building 386 - Interior View to the North –  
During Remediation (Southern Dirt Area)**



# Buildings 386/388 – Site Description (Continued)



**Building 388 - Interior Views of  
Equipment and Products**

# Buildings 386/388 – Site Description (Continued)

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- **Located in South Central Portion of IA C2**
- **Industrial Property**
- **Buildings 386/388**
  - Building 386 - 84,135-Square Foot Building with Large Open Main Bay
  - Building 388 - 69,800-Square Foot Building with Large Open Main Bay
  - Constructed of Metal with an Asphalt and Concrete Foundation
  - Surrounded by Asphalt Parking Areas and Roadways
- **Historic Use**
  - Building 386
    - ❖ Constructed in 1922 – Forge Shop and Metal Working Facility
    - ❖ Currently Used for Production of Modular Office / Classrooms by iMOD Structures
  - Building 388
    - ❖ Constructed in 1922 – Production Shop
    - ❖ Currently Used as Metal Fabrication Facility by XKT Engineering
- **Future Use**
  - Per 2000 Land Use Plan – Industrial Reuse

# Historic Investigations and Remedial Activities

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- **The Twenty-First Century (2001 to 2017)**
  - **Constituents of Concern**
    - ❖ Petroleum Hydrocarbons, Polychlorinated Biphenyls (PCBs) and Metals (Lead)
  - **One PCB Site – Building 386 AL#01**
    - ❖ Remediated in 2010
  - **No Underground Storage Tank (UST) Sites**
  - **Fuel-Oil Pipelines in Building 386**
    - ❖ Segment in Building – E2/3/B386 – Aboveground and Elevated on Building Superstructure
    - ❖ Conclusion of Report – Oil Pipes Aboveground; No Soil Contamination from Underground Pipelines
    - ❖ Granted Closure by the Department of Toxic Substances Control and the Water Board in 2004/2005
  - **2007 – Soil Gas Investigation – Volatile Organic Compounds (VOCs)**
    - ❖ Two (2) Monitoring Locations in Building 386 – IR21GB0200 and IR21GB0201
    - ❖ One (1) Monitoring Location in Building 388 – B388GB0101
  - **2010 – Remediation of Building 386 Area**
    - ❖ Underground Oil Pipelines Discovered During Remedial Activities
    - ❖ Southern Dirt Floor Area
      - ✓ E2/3/B386A, E2/1.5/B386A, E2/1.5/B386B, E2/3/B386D
    - ❖ Northwestern Removal Area
      - ✓ E2/3/B386B
    - ❖ Northern Quench Tank Area
      - ✓ E2/3/B386C
    - ❖ Considered to be Potential Environmental Concerns
      - ✓ Additional Investigation and Remedial Actions Required

# Historic Investigations and Remedial Activities (Continued)

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- **The Twenty-First Century (2013 to 2014)**
  - **Underground Oil Pipeline Investigations and Remedial Activities (2013)**
    - ❖ Excavated Previously Located Pipeline Termini
    - ❖ Collected Soil Sample at Each Previously Located Pipeline Terminus
    - ❖ Excavated New Located Pipeline Terminus
    - ❖ Collected Soil Sample at Each Newly Located Pipeline Terminus
    - ❖ Analyzed Pipeline Termini Soil Samples for Petroleum Hydrocarbons and Polynuclear Aromatic Hydrocarbons (PAHs)
    - ❖ Electronically Traced and Video-Logged Pipelines, as Feasible
    - ❖ Vacuum Tested Bad Condition Pipelines
    - ❖ Flushed (Non-Phosphate Detergent) Oil Pipeline Segments Containing Free-Phase Liquids
    - ❖ Collected Rinsate Samples from Flushed Pipelines and Analyzed for Petroleum Hydrocarbons
    - ❖ Sealed Ends of Pipelines that Appeared to be in Good Condition
    - ❖ Remove Pipelines that Appeared to be in Bad Condition
  - **Underground Oil Pipeline Investigations and Remedial Activities (2013-2014)**
    - ❖ Potholed Along Suspected Pipeline Segments E2/3/B386 and E2/1.5/B386
      - ✓ Evaluate Current Presence or Absence
    - ❖ Collected Additional Soil Samples Along Suspected Pipeline Alignments
      - ✓ Collected Additional Soil Samples to Adequately Characterize Total Petroleum Hydrocarbons in Soil
    - ❖ Installed Four (4) Temporary Groundwater Wells
      - ✓ Evaluate Current Groundwater Conditions



# Historic Investigations and Remedial Activities (Continued)

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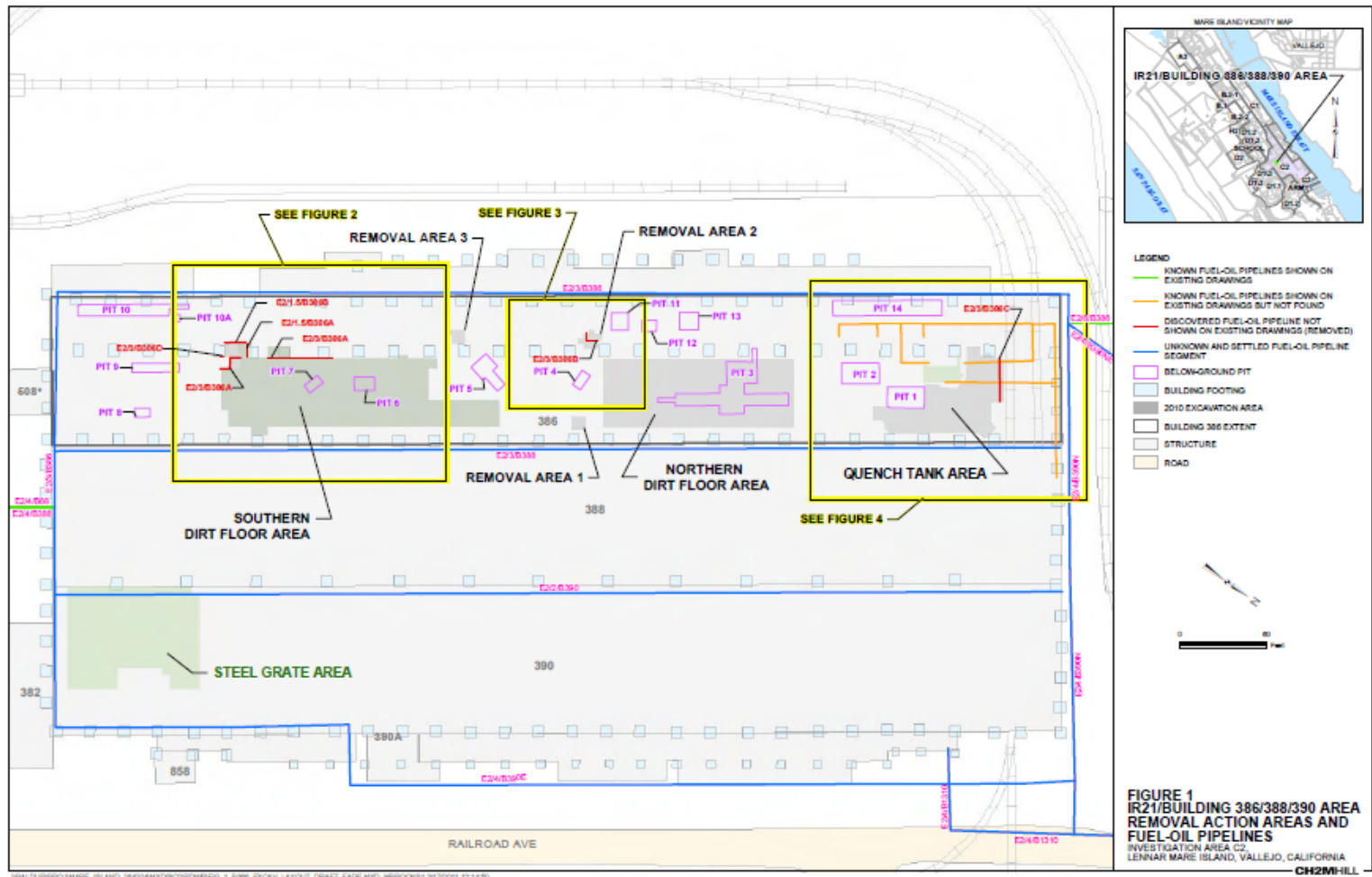
- **The Twenty-First Century (2016 to 2017)**
  - **Underground Oil Pipeline Remedial Activities (2016-2017)**
    - ❖ Excavated Soil at Eight (8) Locations
      - ✓ Six (6) Locations Associated with Oil Pipelines
      - ✓ Two (2) Locations Associated with Underground Tank / Flow-Through Structure
    - ❖ Collected Soil Confirmation Samples
      - ✓ Analyzed for Total Petroleum Hydrocarbons and PAHs
    - ❖ Maximum Remaining Total Petroleum Concentrations in Soil
      - ✓ 2,200 Milligrams Per Kilogram (mg/kg) – Total Petroleum Hydrocarbons as Diesel (TPHd)
      - ✓ 3,700 mg/kg – Total Petroleum Hydrocarbons as Motor Oil (TPHmo)
    - ❖ Maximum Remaining Total Petroleum Concentrations in Groundwater (2014)
      - ✓ 3,700 Micrograms per Liter (µg/L) – TPHd
      - ✓ 3,100 µg/L – TPHmo
  - **Reports Documenting Investigations and Remedial Activities**
    - ❖ *Implementation Report and Request for Closure for IR21 and the Buildings 386, 388, and 390 Area, Investigation Area C2, Lennar Mare Island, Vallejo, California.* January 18, 2011 (CH2M HILL)
    - ❖ *Building 386 Oil Pipe Phase I and II Investigation Report, Investigation Area C2, Lennar Mare Island, Vallejo, California.* May 1, 2014 (Terraphase Engineering)
    - ❖ *Building 386 Tank and Pipelines E2/1/5/B386A, E2/1.5/B386B, E2/3/B386A, E2/3/B386B, E2/3/B386C and E2/3/B386D Soil Removal and Request for Closure Report, Eastern Early Transfer Parcel, Mare Island, Vallejo, California.* June 17, 2019 (Terraphase Engineering)

**Blue Bordered Areas Indicate Locations of Soil Removal in 2010**

**FIGURE 1-2  
REMEDIAL ACTION AREAS AND  
PREVIOUS SAMPLING LOCATIONS**

IMPLEMENTATION REPORT AND REQUEST FOR  
CLOSURE OF IR21 AND THE BUILDINGS 386, 388,  
AND 390 AREA  
INVESTIGATION AREA C2  
LEAKAGE MAINTENANCE, VALLERIO, CALIFORNIA

# Historic Investigation and Remedial Activities (Continued) – 2010



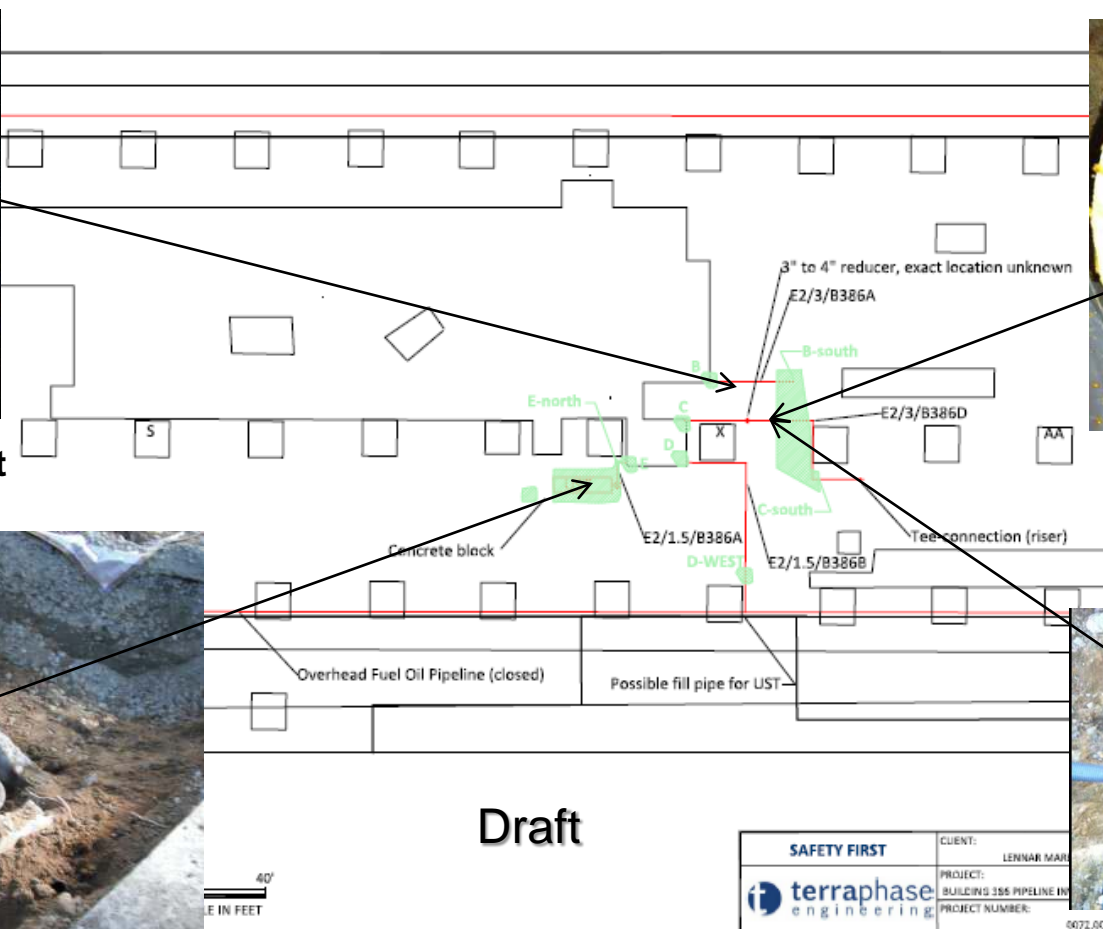
# Historic Investigation and Remedial Activities (Continued) – 2013-2017



Pipeline Vacuum Test



Previously Unknown Underground Structure



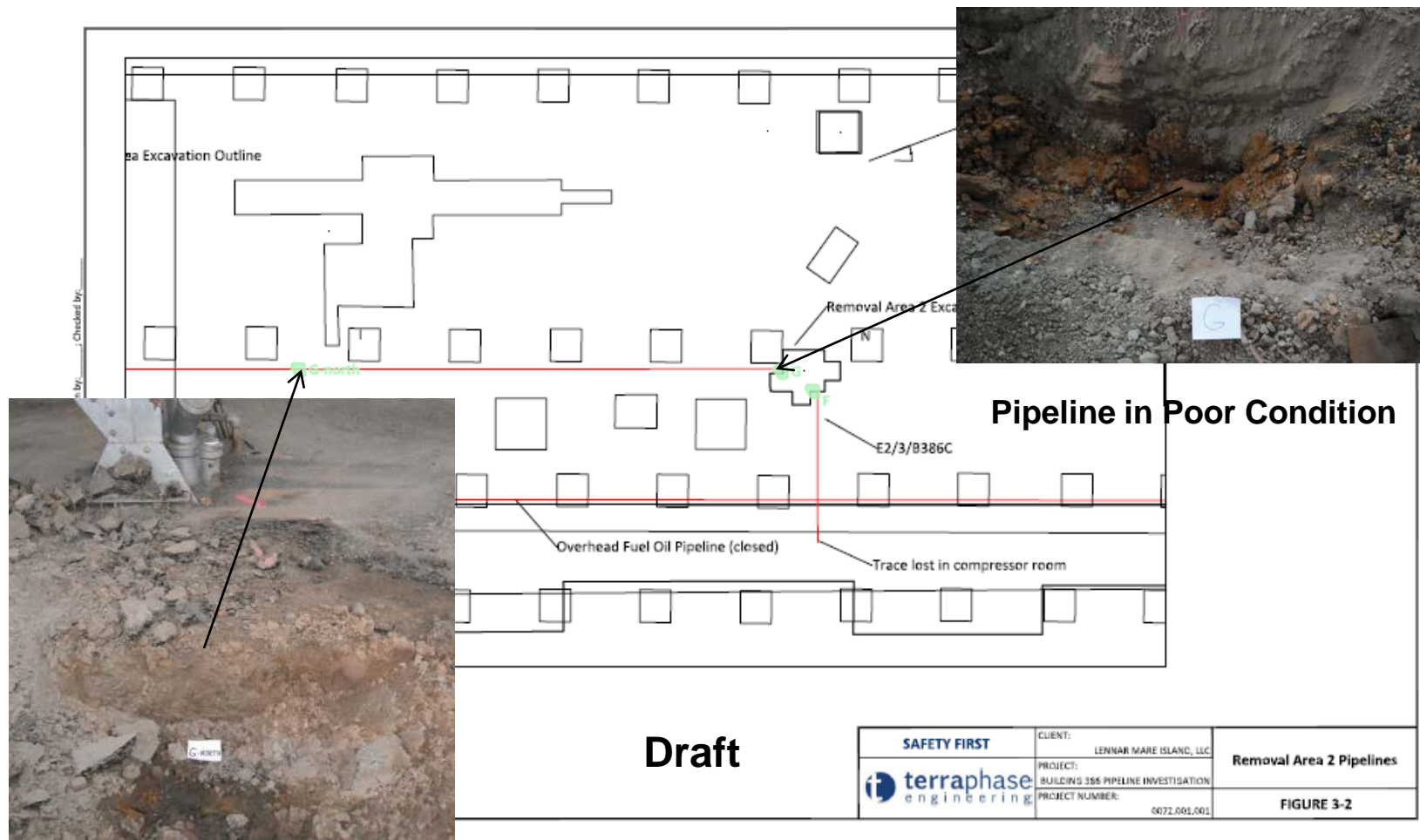
Oil in Pipeline



Draining Oil in Pipeline



# Historic Investigation and Remedial Activities (Continued) – 2013-2017



**Pipeline in Poor Condition**



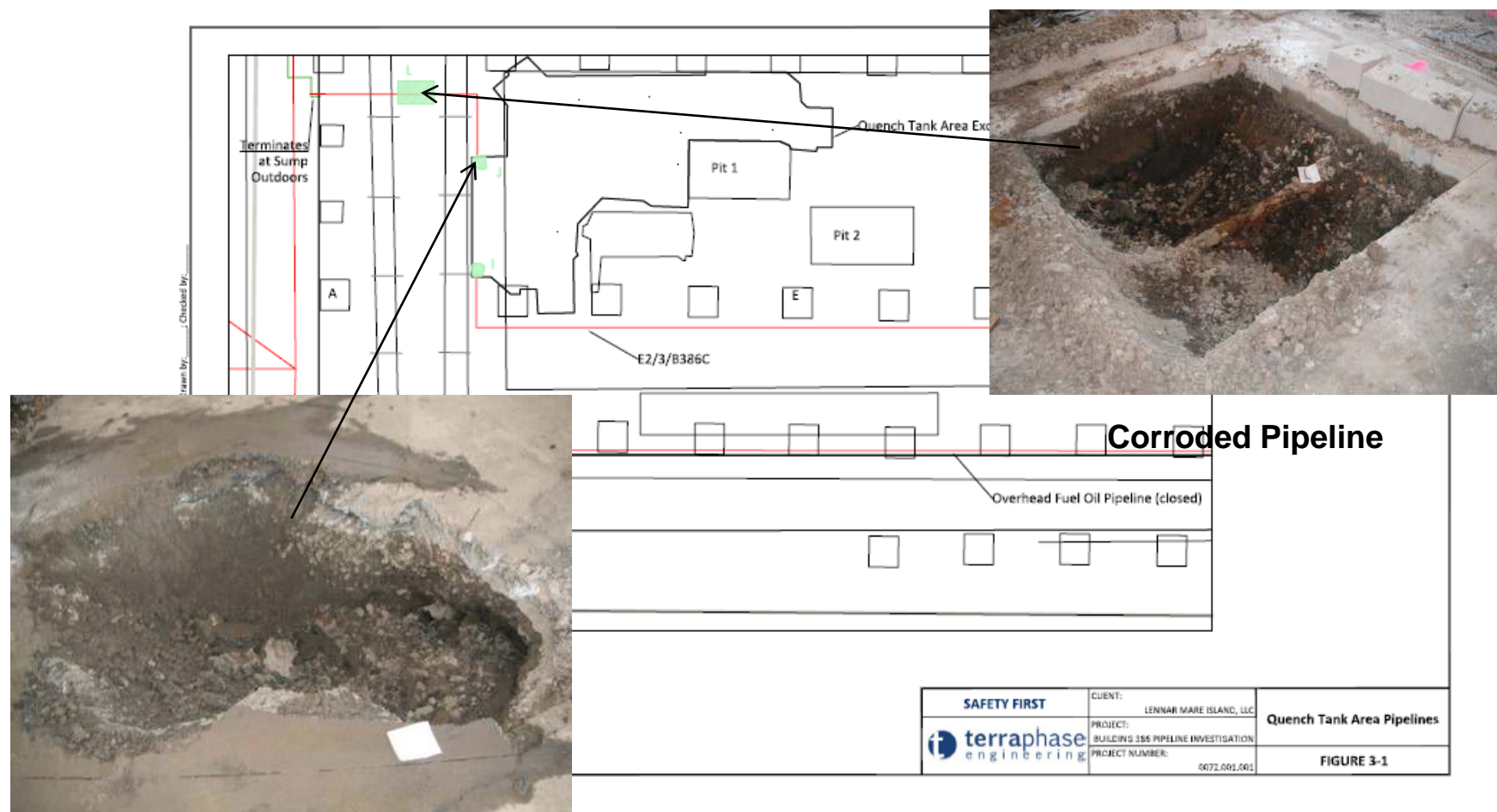
# Historic Investigation and Remedial Activities (Continued) – 2013-2017

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**Pipelines in  
Poor Condition**

# Historic Investigation and Remedial Activities (Continued) – 2013-2017



Corroded Pipeline



# Historic Investigation and Remedial Activities (Continued) – 2013-2017

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**Pipelines in  
Poor Condition**

# Current Status

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- **Current Status**

- Flushed, Sealed and/or Removed Corroded Pipelines
- Removed Underground Tank / Regulator Structure
- Removed Petroleum Hydrocarbons and PAHs in Soil Detected Above Cleanup Goals
- Cleanup Goals - Soil
  - ❖ Total Petroleum Hydrocarbons as Diesel / Motor Oil (TPHd / TPHmo):
    - ✓ TPHd - 500 mg/kg (0 to  $\leq$  3 feet below ground surface [bgs])
    - ✓ TPHd - 5,000 mg/kg (> 3 feet to 10 feet bgs)
    - ✓ TPHmo - 2,500 mg/kg (0 to  $\leq$  3 feet bgs)
    - ✓ TPHd - 5,000 mg/kg (> 3 feet to 10 feet bgs)
  - ❖ PAHs – Range from 0.13 mg/kg (Benzo(a)pyrene) to 2,500 mg/kg (Pyrene)
- Remaining Maximum Concentrations - Soil
  - ❖ Total Petroleum Hydrocarbons as Diesel / Motor Oil
    - ✓ TPHd - 490 mg/kg (0 to  $\leq$  3 feet bgs)
    - ✓ TPHd - 2,200 mg/kg (> 3 feet to 10 feet bgs)
    - ✓ TPHmo - 2,200 mg/kg (0 to  $\leq$  3 feet bgs)
    - ✓ TPHd - 3,700 mg/kg (> 3 feet to 10 feet bgs)
  - ❖ PAHs –
    - ✓ Benzo(a)pyrene - 0.4 mg/kg
    - ✓ Pyrene - 0.85 mg/kg

# Current Status (Continued)

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## ➤ Cleanup Goals - Groundwater

- ❖ Total Petroleum Hydrocarbons as Diesel / Motor Oil (TPHd / TPHmo):
  - ✓ TPHd – 5,000 µg/L
  - ✓ TPHmo – 5,000 µg/L
- ❖ PAHs – Range from 0.2 µg/L (Benzo(g,h,i)perylene) to 11,000 µg/L (Naphthalene)

## ➤ Remaining Maximum Concentrations - Groundwater

- ❖ Total Petroleum Hydrocarbons as Diesel / Motor Oil
  - ✓ TPHd – 3,700 µg/L
  - ✓ TPHd – 3,100 µg/L
- ❖ PAHs
  - ✓ Benzo(g,h,i)perylene - <0.1 µg/L
  - ✓ Naphthalene - < 0.1 µg/L

## • Regulatory Agency Comments

### ➤ Perform Soil-Gas Monitoring in Buildings 386/388

- ❖ TPHd – No Soil-Gas Data
- ❖ Aromatic Hydrocarbons
  - ✓ Benzene, Toluene and Xylenes Below 2019 Environmental Screening Levels (ESLs)
- ❖ Trichloroethene (TCE) – Detected in Soil-Gas at 258.91 micrograms per cubic meter of air (µg/m<sup>3</sup>)
  - ✓ Residential ESL – 29.3 µg/m<sup>3</sup>; Commercial / Industrial ESL - 67 µg/m<sup>3</sup>



# Upcoming Work

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- **Soil Gas Investigation**

- Installation of Soil Gas Monitoring Points

- ❖ Eleven (11) Points in Total

- ✓ Nine (9) in Building 386 and Two (2) in Building 388

- ❖ Points to be Installed to a Maximum Depth of 4 feet bgs

- Monitor Soil Gas Concentrations

- ❖ Two Monitoring Events

- ✓ Dry Weather Event

- ✓ Wet Weather Event

- ☐ After a Significant Precipitation Event –  $\geq 0.5$  inch Over a 24-Hour Period

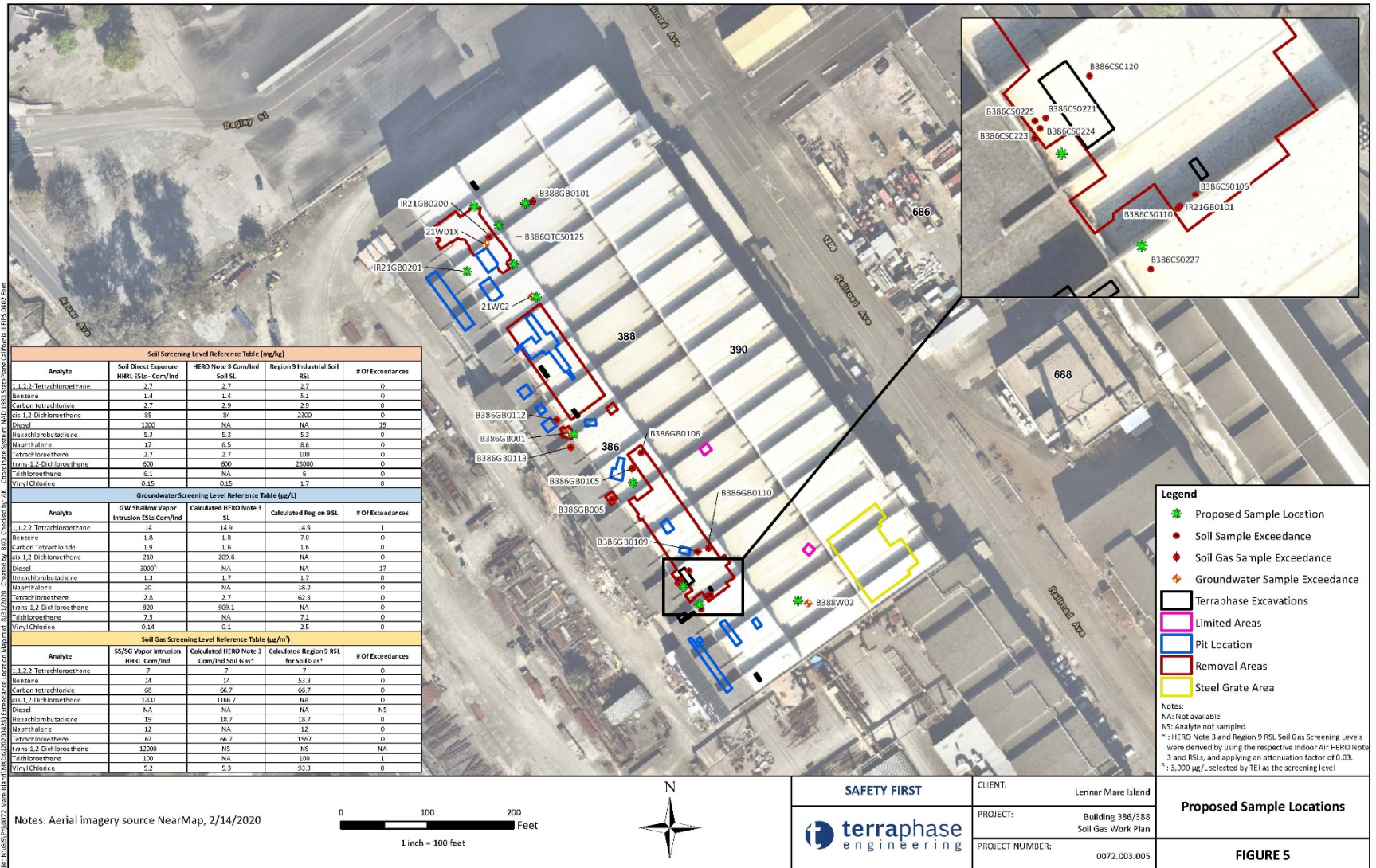
- ❖ Analyze Samples

- ✓ Volatile Organic Compounds

- ☐ Naphthalene, Trichloroethene (TCE), cis-1,2-Dichloroethene (cis-1,2-DCE), trans-1,2-DCE, Vinyl Chloride

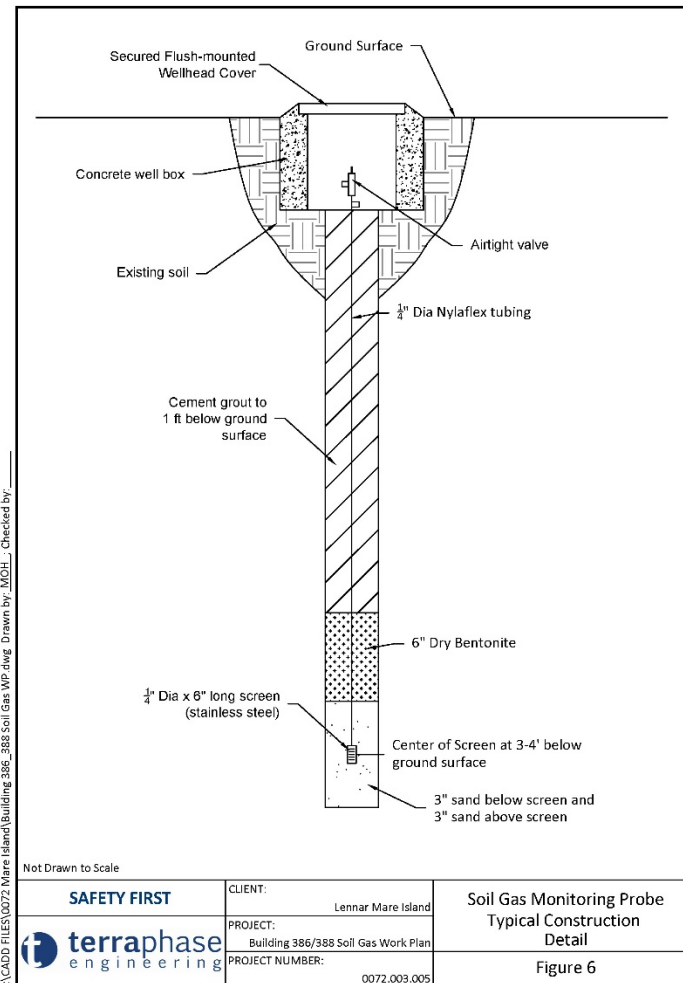
- ✓ Total Petroleum Hydrocarbons as Diesel (TPHd)

## Upcoming Work (Continued)



# Upcoming Work (Continued)

## Soil Gas Monitoring Probe Construction Detail



# Path Forward

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- **Buildings 386/388**
  - Receive Regulatory Approval for Soil-Gas Investigation Work Plan (Fall/Winter 2020)
  - Prepare Cost Estimate for the Work to Navy
    - ❖ Navy Approved Cost Estimate (Early 2021)
  - Implement the Work (2021)
    - ❖ Wet Weather Monitoring Event
    - ❖ Dry Weather Monitoring Event
  - Evaluate Results

**Questions?**



# Acronyms and Abbreviations

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- $\mu\text{g/L}$  – Micrograms per Liter
- $\mu\text{g/m}^3$  – Micrograms per Cubic Meter of Air
- bgs – below ground surface
- DCE – Dichloroethene
- ESL – Environmental Screening Level
- $\text{mg/kg}$  – Milligrams per Kilogram
- PAH – Polynuclear Aromatic Hydrocarbons
- PCB – Polychlorinated Biphenyl
- TCE – Trichloroethene
- TPHd – Total Petroleum Hydrocarbons as Diesel
- TPHmo – Total Petroleum Hydrocarbons as Motor Oil
- UST – Underground Storage Tank
- VOC – Volatile Organic Compound